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Work Organisation and Innovation - Case Study: Bombardier, Belgium

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Work Organisation and Innovation - Case Study: Bombardier, Belgium

Abstract

[Excerpt] Bombardier Inc. is headquartered in Montréal, Canada and is structured around two businesses of almost the same size: aerospace and transportation. It has 76 production and engineering sites in more than 60 countries, and employs 65,400 people. Bombardier Aerospace designs, manufactures and supports innovative aviation products for the business, commercial, specialised and amphibious aircraft markets. Bombardier Transportation is the global leader in the rail industry. It covers the full spectrum of rail solutions, ranging from complete trains to subsystems, maintenance services, system integration and signalling. Bombardier Transportation is headquartered in Berlin.

Keywords

work organization, innovation, Bombardier

Comments

Suggested Citation

Maenen, S. & De Hauw, Y. (2013). *Work organisation and innovation - Case study: Bombardier, Belgium*. Dublin: European Foundation for the Improvement of Living and Working Conditions.

Work organisation and innovation

Case study: Bombardier, Belgium

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Background to the organisation

Bombardier Inc. is headquartered in Montréal, Canada and is structured around two businesses of almost the same size: aerospace and transportation. It has 76 production and engineering sites in more than 60 countries, and employs 65,400 people. Bombardier Aerospace designs, manufactures and supports innovative aviation products for the business, commercial, specialised and amphibious aircraft markets. Bombardier Transportation is the global leader in the rail industry. It covers the full spectrum of rail solutions, ranging from complete trains to subsystems, maintenance services, system integration and signalling. Bombardier Transportation is headquartered in Berlin.

Bombardier's site in Bruges, Belgium was acquired by Bombardier Transportation in 1988, when Bombardier became principal shareholder of a Belgian designer and manufacturer of railway vehicles. Today, Bombardier has full ownership and the Bruges site has become an essential partner in the development and production of innovative public transport solutions for customers all over Europe, including high speed trains for Eurostar and Thalys, shuttle vehicles for the Channel Tunnel (Eurotunnel, UK/France), carriages for Virgin Rail (UK), coaches for Midland Mainline and Hull Trains (UK) and double-decker coaches for SNCB (Belgium). Moreover, Bruges has led the development and manufacturing of light rail vehicles for all major Dutch and Belgian cities, including the award-winning Flexity Outlook tram for Brussels, and the automated city metros for London's Docklands (UK).

Bombardier employs 709 people in Bruges of whom 450 are production workers; 86% work full-time and 14% work part-time. Out of 259 white-collar employees, 82% work full-time and 18% work part-time. There have been no major changes in the number of staff employed over the past five years, but there are some fluctuations according to the production cycles of specific orders. Temporary agency workers are sometimes hired to accelerate production in order to meet certain contractual deadlines. Over the last few years the number of permanent employees has decreased slightly, but in January 2012 a further 100 blue-collar workers were hired on three-month temporary contracts, which have now been extended by a year.

Over the last two decades, Bombardier Bruges has been facing increasing internal and external competition. External competition has been rising because clients are more inclined to switch between manufacturers compared to the situation in the 1980s, when it was more common to receive successive orders from local clients in the context of a long-term business relationship. Managers described their relationships with clients until the 1980s as much more stable than today. Clients placed orders at regular and predictable intervals, and, strategically, Bombardier Bruges was run almost 'as if it were a state-owned company with a natural monopoly'. Today the offer that Bombardier brings to the market is more ruthlessly judged by potential clients in terms of flexibility, time-to-market, quality and, perhaps most importantly, price.

In addition to the pressures from external competition, there are also challenges that come from within the company. Since 1988 the production plant in Bruges has been part of a large multinational group with a high reputation. Bombardier constantly monitors the performance of its national subsidiaries, sometimes rewarding high-performing plants within the group with additional internal orders, but also puts pressure on underperforming plants to do better. The Bombardier group has also lived through a number of worldwide mergers and acquisitions, resulting in overcapacity at group level. Managers at the site in Bruges are well aware of this, and are therefore keen to demonstrate good Key Performance Indicators within the group. The production plant has therefore sought to pioneer innovative production techniques or workplace arrangements to improve its performance within the group. As one of the manager pointed out:

Our point of departure has always been that we must be a step ahead of Bombardier [HQ] in taking initiatives. We realised that in order to remain competitive, we had to change a lot in our plant. We always took initiatives ourselves, before Bombardier stepped up to us and demanded us to be more efficient, more cost-effective. Actually, around the year 2000, we were among the most costly sites, and we realised that this would cause us more and more trouble.

This challenging context was recognised by workers as well as managers. According to one focus group participant:

The company is now facing a different situation. Low-wage countries have caused deadly competition, and you sense this on the work floor and at management level. There is also competition between the different Bombardier sites. The whole context has become a lot more difficult.

Within this challenging context, quality and productivity are major concerns, and in recent years workplace innovation has become the primary means to achieve this. At Bombardier in Bruges, workplace innovation is undertaken in two main ways. The first dimension of workplace innovation aims at improving process efficiency and product quality. It is striking that several of the managers interviewed for this case study, as well as the CEO at the site, have a track record in the automobile industry. Managers had transferred their knowledge of proven production methods in automobile assembly to the Bombardier plant. Additional changes were introduced to the Bruges plant by implementing the so-called Bombardier Operations System (BOS). BOS is a collection of production standards and principles, in part inspired by the widely diffused principles of lean management and Six Sigma, that seeks to increase profit by minimising variability and eliminating causes of defects and errors. BOS aims to guarantee high production standards and to remove as much organisational slack as possible from the process.

The second dimension of workplace innovation, which is more specific to the site in Bruges, is teamwork, which was promoted by dramatically redesigning the work organisation at the production site. Teamwork was implemented to shorten communication lines, to increase the sense of ownership at the shopfloor level, to avoid disturbances in the production flow, and to enhance the problem-solving capacity on the shopfloor. The need for regular vertical coordination by managers decreased as a result of teamworking and the potential for horizontal coordination improved significantly. Blue-collar workers and their supervisors ('team coordinators' as the supervisors are referred to at Bombardier) are granted more responsibility, but also more latitude for taking decisions, which is assumed to enhance job satisfaction as well.

The HR approach of management at Bombardier Bruges is quite clearly and directly driven by market demands. Over time, the market has required Bombardier to deliver custom-built high-quality products more efficiently and at highly competitive prices. Clearly, this has put pressure on the HR strategy and the overall organisation. Bombardier Bruges has been able to improve its business results by changing the division of work and the framework of responsibilities, without being able to promise significant financial rewards for staff in return.

Bombardier Bruges has maintained fairly stable levels of employment over the years. The company is able to provide job security for the production life cycle of any given order, which is around three to four years. With the current orders, the company is able to guarantee job security up until 2015 to its employees. From 2015 onwards the company hopes to benefit from its reputation as a well-performing and reliable production plant to win new deals. Maintaining that reputation, however, requires continued effort. At any given time, several working groups or projects seek to improve performance and working conditions on the shopfloor. For example, leadership skills have recently been given much attention, while a project concerning active ageing has been launched, to improve working conditions so that older workers do not leave the labour market or the company too soon.

The people management practices at Bombardier Bruges fit into the plant's overall aspiration to achieve what the management labels as 'world class manufacturing'. 'World class' is a label that is regularly used in external and internal publicity within the Bombardier Group, to emphasise strategy and achievements in recent decades in improving workplace performance and in pioneering state-of-the-art production practices. It has been a core strategic priority of Bombardier Bruges to establish a strong track record in adopting and reaching high production standards. This was described by managers as a never-ending journey, and a journey in which people management must be continuously aligned.

Nature of the innovation

The general goals of the innovation at Bombardier are better quality and productivity and cost reduction by redesigning the work organisation and introducing teamwork. Job enrichment and increased employee commitment are also goals in this endeavour. This innovation was launched to turn around the previous work organisation, which was characterised by many formal rules and procedures, a high degree of task specialisation and strict supervision. As managers explained:

The general objective of the innovation was to get workers to be committed, to take initiative, to reflect on the process and look for how they can contribute to solving problems within the team, at the work floor. It has now become the responsibility of the teams to arrange their own workplace. Before, we had several disciplines that functioned within their own silos, and who were literally removed from the work floor. Today, we have multidisciplinary teams who take responsibility for a contract at their workshop. So not only at the shopfloor, but throughout the whole organisation, including management levels, we have been integrating more and more departments and functions.

Before teamwork was implemented, the work floor was directed by the shopfloor manager. Virtually on his own, he was responsible for an entire work floor of 60–80 blue-collar workers, since the support staff (engineering, quality, working methods, etc.) were organisationally and physically located somewhere else and were not connected or involved with the work floor. The shopfloor manager received some assistance from his team supervisors, each of whom represented a group of workers and were responsible for training new employees and solving practical problems, but the team supervisors did not have any authority. As a result, most of the problems on the work floor were escalated to the shopfloor manager. The shopfloor manager, in turn, was dependent on the support of a number of other departments for solving issues on the work floor. Such issues usually required the help of the engineering department, the quality department, the working methods departments, or sometimes the team of buyers. As a result of workplace innovation, many of the tasks that were previously done in such expert departments are now at least partly delegated to the production teams.

The current production teams are composed of 8 to 12 operators and a team coordinator, who works on the production line together with his team. Much responsibility now lies at the operator level, and managers only interfere when disturbances occur. Within the production teams, the work pressure is distributed over the whole team, so that not only the team coordinator but also the team members have to fulfil certain team roles and tasks (security, quality, cleanliness). It is thus the team that is responsible for the delivered products, in terms of quality, timing and costs. As a result, they have gained more autonomy. Communication lines are shortened by creating operational teams. The purpose of these operational teams is to provide continuous expert support to the production teams. The operational teams are therefore constantly present in the production hall, literally close to the production teams. The operational teams are composed of a shopfloor supervisor, a work methods specialist, a quality expert and a planner. Note that in the previous work organisation such functions would be organisationally and physically removed from the production line, and grouped into separate departments. Now the supporting staff are located closer to the work floor and are more involved.

Process of implementing the innovation

Teamwork was implemented initially in a pilot production hall in 2002, and has thereafter been steadily expanded to the entire blue-collar workforce. A large number of white-collar workers in departments which play a supporting role in the production process (quality, engineering, maintenance, buyers, etc.) have also been affected by the innovation. Many of their former tasks are now being integrated into the work of teams at the shopfloor level. According to the HR director, the work organisation project directly involves 350 blue-collar workers in Bruges in addition to 35 or 40 white-collar employees who work in administrative or engineering divisions within Bombardier.

Managers at Bombardier are leading the innovation. The process of innovation is set up in a participatory way but is management-led and managers retain discretion in making major decisions.

Workplace innovations at Bombardier are generally implemented through working groups and steering groups. For each working group, one person is assigned with end-to-end responsibility for a project. Although steering groups can include non-managerial staff, the strategic decisions are closely controlled by the management layer of the company. Whatever direction a project takes, major changes require approval from the site general manager. For example, one of the projects concerns shopfloor supervisors and the idea is to grant more autonomy to these line managers. Questions of how this is going to be organised, which responsibilities they will take on and what conditions should be specified are addressed in a step-by-step fashion, with extensive staff communication, but with management definitely holding control over the process.

An important feature of the innovation is the incremental implementation process. There was a large time span between the moment the concept of teamwork was first introduced, the start of the pilot project at the shopfloor that build the trams and the eventual general implementation of teamwork at Bombardier Bruges. As such, staff had the time to get used to the idea and had the opportunity to formulate feedback and, thus, became more and more involved. So apart from the working groups mentioned above, pilot projects are established to try out new ideas and to allow for adjustments before implementing changes in other workshops. In other words, the innovation (and all changes) are implemented gradually, but with determination. For example, within the framework of the quality excellence project teamboards were installed for each team to display their KPIs. Before the teamboards were implemented, they were proposed to the shopfloor managers, who could give their feedback. Their comments were noted and the layout of the teamboard was adjusted.

Senior managers clearly have retained a great deal of control over the process. Many projects involve the HR manager, and much of what happens in several innovation projects or sub-projects is coordinated and monitored by the site's quality and performance management department.

There is also clear involvement of the **trade union representatives** in workplace innovation projects. The initiative for the project came from senior managers, so it started as a top-down process. However, according to the HR director, as the project was implemented, the working groups of production staff gradually took more and more control, and are currently driving the implementation process. This was in part confirmed in the focus group, where blue-collar workers indeed said that their ideas now have a greater chance of being heard and implemented. The attitude and the level of involvement of the trade unions has also improved over the last decade. To illustrate this improvement, the HR director said that the trade union representatives at Bombardier invite their peers from other companies to visit and they present the work organisation innovations at Bombardier as a best practice.

According to the HR manager, the trade unions representatives have been able to help decide how performance evaluations should be conducted. Overall, the HR director valued the constructive relationship with the unions, claiming that management and workers often share objectives, and social relations at the plant have become much more constructive.

However, in the interview the trade union representatives felt that they had no choice and that going along with the workplace innovation initiative was the only reasonable option available:

We were involved in the whole change project, but that was more or less under the pressure. It was the only available option to avoid a more severe restructuring. If the plant in Bruges and its employees wanted a future, different approaches were needed. So our involvement was not entirely a voluntary choice.

Also, the importance of including workers was stressed in the interviews with managers, but it came out less strongly in the focus group with staff. This is probably because the overall redesign of work in terms of the overall strategic allocation of tasks and responsibilities is still mostly controlled by managers, whereas shopfloor workers are mainly involved in decisions that affect their direct working environment. As one manager put it:

The worker on the floor is definitely closely involved in the operational stage of a project, like the layout of workstations, because they are the ones that are based there, and they know best. It is their living environment for the years to come, so they have to approve.

Workers are thus often consulted in the more concrete stages of the change trajectories. Workers' opinions are solicited in pilot projects that serve as an important feedback mechanism. However, workers who took part in the focus group did not regard their involvement in the change processes as particularly extensive. When the trade union reps were asked about the involvement of workers in the change process, they tended to think in terms of the pilot projects. This seems to suggest that the prerogative for the strategic decisions is firmly controlled by management, whereas worker involvement is possible in later operational stages of the projects.

Interviewees believed that the costs of making the innovations were very difficult to quantify. The work innovation projects appear to be most time-consuming for management and for the quality and performance management department.

European Social Fund (ESF) project money was used to support the project, to allow workers and team coordinators to participate in working groups, without loss of revenues. The project was subsidised under an ESF call on 'activating work organisation' that typically provides a budget up to €100,000.

There were significant training efforts targeted mainly at team coordinators and shopfloor supervisors. This was explained by the HR director:

We created a new role, that of team coordinator, and gave the team supervisors the chance to become team coordinator. We did not have the option of recruiting new employees for the job, as this was not socially acceptable. Most team supervisors accepted the offer of becoming team coordinator. That did not happen overnight, but with the necessary guidance and training. They received nine days of training, spread over several months.

The evolution of the project is best described as an organic process in which satisfying certain needs reveals other issues that lay the groundwork for follow-up projects. In other words, every people management initiative solves a number of issues, but also tends to raise a number of additional challenges. Often different projects run in parallel on different yet interrelated, themes. For example, the implementation of teamwork has clearly improved the capability for coordination and problem-solving at the shopfloor. At the same time, assigning more responsibilities to the operators on the shopfloor puts greater stress on the interpersonal relations between workers in the teams. Managers have therefore launched a people management initiative to improve leadership skills and commitment at the work floor. Additionally, in

recruitment procedures more weight is given to social skills and employability, whereas in the past it was predominantly technical skills that were deemed important:

When we recruit new workers we primarily look at their employability and learning capacity rather than their technical skills. Because the technology of today can be different tomorrow, and you have to make sure that your staff can evolve at the same pace. Issues like: how do you communicate with your colleagues, how do you work in a team, do you accept criticism from your peers are now assessed for all candidates.

The yearly performance interviews used to be more about updating personnel files. Today, they are used to really evaluate the performances and set clear objectives. So it is more about development and not a moment to discuss, for example, absence. For workers who score less on social skills, there are follow-up sessions to evaluate their progress. The trade union reps were positive about the way the performance interviews are executed. One of them noted: ‘Now people are informed in advance, they don’t always like that, but they get a change to adjust their performance and that has a certain positive impact.’

Recently, considerable effort was put into developing leadership skills. In one project six competences of leadership are defined and transcribed to management and executive staff through education and training. In addition, the HR department has set up a project for 50 white-collar workers, from a variety of management and non-management jobs, who really supported the innovation and took the lead. They were nominated ambassadors, and are included in the leadership track.

Reactions and challenges

When the concept of teamwork was first introduced, the workers and many of the managers found this a vague concept. They could not imagine the consequences it would imply.

At the start, the workers and trade union representatives were reluctant to adopt the innovations. Managers' initiatives were not enthusiastically accepted from the offset; instead the workplace innovation programme was initially viewed with great scepticism. Participants in the focus group conducted for this case study said:

At first we were really negative. Suddenly you are overwhelmed with information. There was a lot of distrust. For us, it was a whole new way of working and the weight on the shoulders of the employees was going to increase because positions disappeared. It led to resistance, but also to jealousy among the workers.

As time passed, employees became generally positive towards the changes. According to the trade union reps intergenerational differences played a role:

Maybe it has also something to do with differences in generations, because we notice that new employees prefer this way of working. And more people find it good that they have some autonomy in performing their tasks. But there are still workers who prefer the old system. And that was our biggest concern: what will happen with the workers who are resistant to the new way of working? But the teams are compiled so that you have workers who support the whole teamwork idea and are pioneers and team members who have a more reluctant attitude. And that works.

Since blue-collar workers are also included in the workgroups they have a direct feedback mechanism at all levels. But more important are the pilot projects. New ideas are quickly tested through pilot projects and evaluated on their chances of success and on willingness of the staff to support the changes. For example, when the idea of the teamboards was announced there was a lot of resistance from workers. 'We are not paid to write or to fill in documents, but to assemble trains', was their initial reaction. Now it is part of their job, but it took time to get used to. Management never forced a change, but gave the workers the time to get used to the ideas and to involve them as much as possible.

Impact on employees

An evaluation of the project has been undertaken and was due to be published in 2012. Based on the company's own analysis they know that different aspects are positively evaluated. Only workload is still negatively perceived.

The HR department also conducts a yearly employee engagement survey. As they adapted the survey and changed indicators over time, they cannot assure that findings of the engagement survey are related to the work innovations. The results are moreover partly affected by economic conditions. For example in 2008 the company lost an important project, causing a sharp feeling of job insecurity within the workforce. Increased stress was reported in the employee engagement survey at that time.

The surveys' results show a rather mixed picture of the impact of work organisation innovation at Bombardier. Out of the 14 topics covered, health, safety and environment, performance management, employee engagement and market competitiveness and customer focus have the best scores with over 90% of employees rating these aspects favourably. Development opportunities, site/location management and work organisation and workload have the most unfavourable votes.

Trade union reps however felt that it was time for Bombardier's management to let workers share the benefits of better performance in production: 'We feel that it is time that the company does something in return for their employees. The workers know that quality and productivity has increased. It is thanks to them that orders are delivered in time, and now, they want some recognition for the efforts they have made.'

Apparently, the workers felt that they had reaped few financial rewards from the performance improvements, apart from an occasional night out at the expense of the company. The workers felt that being rewarded with dinner and a game of bowling is not really sufficient compensation for the benefits that have accrued to the company thanks to the new work organisation. According to the workers productivity increased by 30% and quality has improved. The focus group made it clear, however, that for the workers the essential motivation for accepting the changes and the most important outcome is job security.

Implementing multidisciplinary teams, cancelling the function of team supervisor and shortening the communication lines has flattened the organisational structure. In addition, tasks are less divided and integrated in the teams as much as possible. As a result, there is less internal mobility between jobs but job content is broader. According to the HR director quality of working life has improved significantly, thanks to the job enrichment of operator jobs on the work floor, as well as employee well-being. 'Jobs are more challenging, which helps the organisation to adapt to change and job satisfaction and motivation has increased.' However, not all shopfloor workers agree that jobs are now more satisfactory. One of them commented: 'If you prefer versatility, then the jobs are more appealing. But we still work for several years on the same order, so for most workers, work is not that varied.'

The commitment of workers has increased as they have been assigned more responsibilities. As a worker acknowledged: 'now you are responsible for what you leave behind at the end of the day'. Management realises, and trade unions point out as well, that there is a group of workers with a long career at the company who do not support the changes:

Not everybody embraces those responsibilities. This is partly linked to different generations, even though there are also older workers who ask for more responsibility. If you are working in a system that you do not really support, then your well-being does not improve.

One of the managers admitted that such attitudes have been partly bred by the company itself in the past; the old work organisation has mis-educated the workers throughout their entire career by making them stick to a narrow and standardised range of task.

Implementing teamwork increased mutual social control exerted by workers on each other through the production process. But the HR manager noted: 'we are still a caring organisation. It is not that workers who perform less well are excluded from the team by its members.' The workers confirmed that the collegiality within the teams is strong. But trade union representatives had a reserved opinion and they pointed to a danger of overcommitment as a result of unconscious peer pressure, and evoked the necessity of protecting workers against themselves:

Our job as trade union reps has changed. Before we had to mediate in conflicts. Now we protect the workers from themselves and make sure that self-management does not cross a number of social limits, that the commitment does not go too far, because some workers would do a lot to finish the vehicle in time if the team has committed to do so. Sometimes they would gladly come to work on an official holiday if really necessary. We have some important collective agreements, that have to be followed by everybody, that come before the team.

They also explained that they want to avoid all kind of competition between teams:

Before, when there were no accidents during the year, everybody was rewarded. Now the team that suggested the most improvements gets rewarded, with dinner and a bowling game. We don't want competition between teams because, for example, we don't want an older worker to feel out of place because he is in a team with younger workers and has difficulties in keeping up.

As tasks are less divided, employees have to be multi-skilled. The shopfloor workers recognise that being multi-skilled is very useful, as it is easier to replace somebody when sick or on leave, although there was no impact on staff absence rates as a result of the innovations.

Workload is, however, a pressing problem that is yet to be resolved. All respondents agreed that the workload has not decreased at all compared to the beginning of the innovation project. On the contrary, targets are regularly tightened, so that workers are also regularly urged to be more efficient. 'That is why it is so important to stimulate your employees and involve them in the whole innovation project. We also need their ideas to work smarter. We are constantly in a change process and that causes a certain workload.'

By shedding layers and implementing teams, direct communication with managers has clearly improved. Trade union representatives are generally satisfied with the communication structure and workers also notice an improvement:

Now the organisation listens more to the workers. We also have a say in it, while before we just had to accept how things were done. Also before, if you wanted to replace a tool, you had to speak to four people. Now, the relationship with the shopfloor manager is much closer and managers are more accessible.

However, opinions on this were divided and most of the workers do not perceive management as being closer: 'We have an open communication policy with our workshop manager, but the management levels above are more distant.'

Some issues are, however, easier to arrange in the current work system than before. An example given by management, trade union reps and workers was that there are now fewer conflicts around holiday planning. Before, this was a cause of tensions, and trade union reps often had to intervene on conflicts regarding holidays. Co-workers were not systematically informed about who was on leave, which created capacity problems in production. These situations are a thing of the past because such decisions are now taken within the team. According to the workers, their work-life balance has improved because now they can decide within the team when they go on leave.

All recognised that health and safety practices have improved, as workers were more involved in implementing them and, thus, became more aware of risks and how to manage them. The organisation also pays a lot of attention to ergonomics. For example, team coordinators are directly involved in the set-up of the workplace and are consulted for adjustments. In addition, in the workgroups on efficiency and the improvement of working methods, ergonomics is also an important topic.

Every team is granted 5% extra time in addition to estimated production time to perform team tasks. This includes daily meetings between the team coordinator and the shopfloor manager, as well as team meetings. The extra team tasks that came with implementing teamwork have to be done by the whole team and not only by the team coordinator. This tends to create some difficulties concerning the role of the team coordinator. First of all, it is a job with a lot of paperwork. Second, the team coordinators have to give unpopular instructions to their team members. For example, they have to appoint a team member who is responsible for the lift equipment, and someone else who has to keep the workstation clean. Not everybody is always ready to assume such tasks, and there is no external referee to help make these decisions. One employee noted that: 'Team coordinator is not a rewarding function. They involve you in everything, but you have to make sure that you find somebody who wants to do the job.' As one staff member in the focus group reported: 'there used to be someone in the plant who took care of the equipment and tidied up the workspaces. Now we are, as a team, responsible for the maintenance of our workplace. And that is good, but it is difficult to tell a colleague to empty the garbage.' Third, the team coordinator is a blue-collar worker, so they cannot claim to be in a position to take impartial decisions: they are an interested party in the daily division of work. According to one team coordinator in the focus group, there should be a white-collar worker who supports them, when they have problems with their team. This need is, however, not felt equally in every team. Some teams apparently felt they would like an outside referee to help them in taking difficult decisions; in other teams the shopfloor manager appeared to take on this role. Finally, another difficulty is that the job of team coordinator is not a secured position. There is a pool of team coordinators, and so it is quite possible that someone who is a team coordinator one year will go back to a standard operator's position the next year. Depending on the orders, there are regular switches in the appointment of staff to this role. This makes coordinators feel exposed and unprotected in their role.

Impact on the organisation

The teams have some influence on how work is done and their results are also measured. A team is responsible for the work it delivers, meaning that the team members are jointly responsible for quality, timely delivery and costs. Management introduced team score boards with a few KPIs and tightened them gradually, challenging the teams to achieve the targets. Over the years lean assessments results in BOS doubled, from 47.5 points in 2004 to 70 points in 2007. Improvements in the production system have risen 500%. Whereas in 2004, 2005 and 2006 the implemented improvement rate per person was less than 0.1, the team approach changed that rate significantly. In 2007 almost 0.5 implemented improvements per person were counted (127 improvements in production) and in 2008 almost 0.8 implemented improvements per person were counted (104 improvements in production). Quality also increased. For example the rate of open issues at shipment declined from 10 in 2007 to 0 in 2008. On-time delivery has gone up from 93% in 2006 to 97% in 2007 and the backorders have been reduced to zero.

The pace of work has increased and workers are more efficient. In addition, the workspace surface has been reduced significantly, as extra production lines have been fitted into the production halls. Jobs are enriched and employee involvement has increased: ‘we train each other, even outside the team because we notice that being multi-skilled is very valuable to cover illness and leave’. Lines between functions have disappeared: ‘our team coordinators now have mechanical and electrical skills’.

Bombardier Bruges successfully demonstrated that the workplace innovation has greatly improved performance on a wide number of KPIs. These positive results have been noticed both within the Bombardier group and by other companies in Bombardier’s direct environment. Accordingly, Bombardier Bruges has been able to attract orders from within the group, as well as to close a deal as a subcontractor for Siemens, which is their main competitor in the sector. Bombardier’s track record in workplace innovation has helped to improve workplace performance, and thereby to close deals and to secure employment. In this sense, workplace innovation has clearly contributed to Bombardier’s ability to satisfy market demands.

Lessons learnt and future plans

The changes brought about by the initiative have been mostly positive, though most interviewees were aware of ongoing problems, existing tensions and continuing shortcomings. The interviewees at management level were clearly more enthusiastic than trade union reps and workers. In their view, the changes were an overall success, since practically all KPIs increased significantly.

Trade unions were moderately satisfied, as were shopfloor workers:

At the start you have a lot of doubts concerning all those changes. But after a while you experience the benefits. And you see the positive aspects of the whole system. The collegiality between us workers is very good, even though that was true before as well. That is why the teamwork concept works as well. We do things for each other because we know each other.

Nonetheless, the workers had some complaints, particularly relating to the lack of financial benefit that accrued to them from the innovations. Few monetary benefits of extra performance appeared to trickle down to the workers on the shopfloor:

Now, we have more opportunities to communicate improvements and that is a good thing, but with the disadvantage that it is not financially rewarded. While the company does benefit financially, we earn a voucher for a night out.

In addition, the blue-collar workers pointed out that off-the-job training sessions are mainly organised for new employees, whereas for those already working at the plant, new skills needed for the enriched jobs had to be learned on the job. As a focus group participant said: 'Management presumes wrongly that those who have been working here for a long time know everything. And the working pace is too fast to find the proper time to learn new tasks.'

One critical success factor for the initiative is that the changes were implemented gradually, with a lot of communication. Employees had the opportunity to give feedback through workgroups and pilot projects, and contribute to shaping the innovation.

Another success factor is that innovations, once launched by management, were not implemented rigidly but were continuously adapted by considering feedback from practical experience. As the performance manager who is responsible for the coordination of all change projects explained:

The changes were adjusted to our work organisation. You cannot simply apply a copy-paste method, because every company has its own history. You have to try out the changes and adapt them or take a step back. By communicating not only the changes but also the adjustments, the employees realise that they have a say in it and that it is not a 'take it or leave it' situation.

Another example is of an initiative that was re-evaluated after due consideration. As one employee explained:

All Bombardier plants are evaluated by the Bombardier Operations System. At a certain point they recommended the tagging system where, if an object is not in the right place, you put a red tag on it and write your comments. Other people can then respond. If we wanted to score well at the Bombardier Operations System, we had to introduce it to the workshops. But it did not work here in Bruges because we have a different culture. We have a direct communication system. If something is not in the right place, we tell staff and do not write it on paper. So we cancelled it.

It is perhaps important to note that, even though all interviewees agreed that workplace performance has generally improved in terms of efficiency, quality and flexibility, the impact on employee well-being has been less straightforward. One trade union representative said: 'If you ask the workers who started in this plant when they were 20 and who have now reached the age of 40, who have worked in both systems for quite a long time, which system they prefer, most of them would choose the old way of working.' The trade union representative believed that some of the workers experience more stress, because the work pace has accelerated and because they are now held responsible for things that go wrong. It is difficult, however, to evaluate whether such stress is the result of the increasing demands from the external environment, which goes hand in hand with a sentiment of less job security, or whether such pressures are caused by the workplace innovation itself. It is clear, however, that job insecurity was mentioned as a source of stress and a major concern. The engagement surveys conducted by the HR department indicated that in insecure periods, the work pressure and stress registered in these surveys is a lot higher.

However, four out of five participants in the focus group had over 20 years of tenure in the company, and none of them considered it feasible or desirable to turn back the clock. The workers in the focus group recognised the merits of the new work system, for the sake of the company and for the sake of themselves. They recognised that the new work organisation helped them to deliver better performance: 'we would not recommend a return to the old way of working or to eight years ago. Maybe there are certain things or facets we would restore, but in this present context it is not possible to go back.'

Nonetheless, there are some indications that the workplace innovation programme is in itself indeed a potential cause of stress. In particular, by implementing teamwork, tasks that used to be done at management level or by other departments are now shifted down to the shopfloor and to the production teams. Responsibilities that could previously be decoupled from the work floor are now issues for the teams. This has led to job enrichment, as teams and team members now enjoy much more autonomy. On the other hand, the extra responsibilities put pressure on individual workers, since they are now held accountable for issues that were previously not even part of their job description. Furthermore, teamwork challenges the interpersonal relations between team members, as colleagues have to divide tasks among themselves. This coordination burden sometimes creates interpersonal friction. The new work systems can exacerbate these frictions.

Workers realised and appreciated that they now have the ability to cope with problems that arise during the production process. They also recognised that this leads to better work performance, and sometimes to less stress, particularly when team members have worked together for considerable time and have become accustomed to one another. For example, the way the holiday planning is now organised leads to a better work-life balance, according to the workers. They would also recommend Bombardier to a friend or family as a good place to work. Workers also realised that the innovation programme has improved the competitiveness of the company, and is thus also an important means to ensure job security.

A final issue that deserves attention is that the new work organisation requires a lot more interpersonal coordination, which may cause strained relationships and stress in the team. Organisations that implement self-managing teams should perhaps be more attentive to this problem. A prime benefit of self-managing teams is that frictions in the production process can often be swiftly solved without intervention from outside departments or hierarchical superiors. At Bombardier self-managing teams helped to eradicate situations where workers explained a problem to a superior and then had to wait for an answer. In the latter case, the stress of having to deal with an issue was escalated throughout the organisation. Under the current system, this happened less often, and problems were dealt with more efficiently within the teams. This does not imply, however, that unanticipated problems or disturbances in the production process no longer cause stress any stress at all. Whereas in the old system such stress situations could proliferate throughout the organisation, the stress of solving issues is now concentrated in operational teams.

Even though staff from a number of support functions (working methods, quality, planning) are present within each production hall, the operational teams did not always feel adequately supported for solving problems or issues on the work floor. For some teams that were represented in the focus group this was a minor problem, but apparently other teams at the plant to some extent experienced a lack of support. The lesson to be drawn here is that having self-managing teams does not mean that such teams can function in perfect isolation. On the contrary, such teams can only continue to deliver effective work if they can count on a supporting network that provides occasional assistance when needed. How such assistance should be organised is an important practical organisational issue that may be a significant source of stress for workers if it is neglected by the organisation. Bombardier's management is aware of these issues and are working to cope with such problems.

Teamwork, together with intensified implementation of lean manufacturing and Six Sigma methods, implied far-reaching changes in job design. Operators' jobs today are significantly different from 10 years ago. In addition to technical production tasks, every operator also takes on tasks to the benefit of the team as a whole (such as maintaining safety, quality, cleanliness of the workplace, supplies, tools).

Two priorities were mentioned throughout the interviews as challenges in the years to come: leadership and active ageing (measures to keep all generations and particularly older workers fit at work). Leadership is a priority for management because social skills are required to deal with the coordination challenges at team level. Adapting working conditions for ageing workers is, given the demography of the workforce, another challenge. This point was most strongly raised in the focus group:

The biggest challenge is that the average age in the workforce is so high. There has been a lot of attention to ergonomics, but the job is not only physically but also mentally hard. In addition, a lot of the easy work that could be done by employees that are at the end of their careers is outsourced to subsidised workshops or low wage countries. Since we have to work longer, we wonder how they will address this issue.

Conclusion

Bombardier Bruges is a production plant with a long history. From the outside the buildings look like the remnants of an earlier industrial era. Inside, however, is a modern production facility that produces state-of-the-art railway vehicles effectively and efficiently. While the production site in Bruges is steeped in industrial history, the company had to reinvent its work organisation in order to ensure its continuing existence. Market conditions have become more demanding and more challenging over the last decade. Bombardier Bruges appears to be meeting these challenging by implementing up-to-date production management methods, and by implementing teamwork as an efficient way to increase productivity and quality while maintaining acceptable standards of well-being for workers. In addition to market demands, workload and demography pose serious additional challenges for the organisation in the years to come. Furthermore, as the operators in the production teams are now held accountable for team performance, the workers may experience work-related stress, particularly when they feel inadequately supported when taking difficult decisions. Bombardier's current emphasis on leadership is intended to mitigate such difficulties.

All in all, the workplace innovation programme at Bombardier Bruges is considered a win-win by all involved, as employee well-being and organisational performance are advanced at the same time. The fact that management realises that meeting the challenges ahead requires continued management attention is a prime guarantee for the continued success of the workplace innovation programme. The well-established involvement of trade union representatives is an additional guarantee that the social protection of workers will not be neglected.

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